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Understanding the Role of Business Analysts in Digital Transformation: A Multivocal Literature Review

Abdullah Mashhood
Auckland University of Technology, amashhood77@gmail.com

Mali Senapathi
AUT University, mali.senapathi@aut.ac.nz

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Abdullah Mashhood
School of Engineering, Computer and Mathematical Sciences
Auckland University of Technology
Auckland, New Zealand
Email: amashhood77@gmail.com

Mali Senapathi
School of Engineering, Computer and Mathematical Sciences
Auckland University of Technology
Auckland, New Zealand
Email: mali.senapathi@aut.ac.nz

Abstract

In recent years, Digital Transformation (DT) has emerged as an important phenomenon in both academic and practitioner literature. Organisations are striving to transform to meet the dynamic needs and expectations of customers as social, mobile, and digital technologies continue to transform people's lives. While the significance of business analysts in bridging the business/information technology and client-developer gap has been recognised in the industry, there has been limited research into the skills and practices employed by business analysts. In particular, there is lack of empirical research in understanding the relevance and significance of the role of business analysts in DT. This instigated the need for a Multivocal Literature Review (MLR) - we adopted the context, content, process, and outcomes framework to review both peer-reviewed and a selection of grey literature to investigate the skills, practices, and services employed by business analysts in DT. Our findings reveal that business analysts must build a skill set composed of deep business knowledge, collaboration and facilitation skills, agile methods and continuous learning to effectively meet expectations of DT initiatives.

Keywords Digital Transformation, Business Analyst, Multivocal Literature Review

1   Introduction

In recent years DT has surfaced as a new buzz word resonating in the industry as well as in academia (Vial 2019). The term DT was adopted from the practitioners (Mergel et al. 2019), and it has become one of the leading terms among CEOs concerning their IT-related business priorities (Prentice 2017). DT is a multifaceted phenomenon and evolved by the integration of digital technologies into business to improve the competitiveness of the enterprise in the age of digital disruption (Tekic and Koroteev 2019). Apart from improving IS, DT involves the reconsideration of the three key areas related to the enterprises: customer experience (CX), operational processes and business models (Nahrkhalaji et al. 2018).

Novel digital technologies like SMACIT (social, mobile, analytics, cloud and internet of things) enables the progression of digital applications and the inception of DT (Guinan et al. 2019) which creates opportunities for all types of businesses, from start-ups to established enterprises. Researchers have found that innovative technologies as one of the enablers for the DT; but it is more compound than just the adoption of technology (Tekic & Koroteev, 2019).

Business analysts play a vital role to ensure that the implementation of technology can achieve business goals (Richards and Marrone 2014). However, under DT banner, the focus is to rebuild new business models by the use of technology to cater to the needs of customer expectations (Mergel et al. 2019). It implies that the typical approach of eliciting business requirements must adjust accordingly with such a paradigm shift, and it must add a capability to understand the customer's perspective as well (Brennan and Phul 2017). Almost every major organisation is in some phase of DT, leading to a company-wide cultural and technical change (Shaughnessy 2018). In today's environment, when innovative business models are disrupting the marketplace, the effective and strategic business analysis for the enterprises have become more vital than ever (Brennan and Phul 2017).

While there is some empirical research on the role of business analysts in IS development, there is no specific research on the significance of their role in the domain of DT (Richards & Marrone, 2014). To the best of authors' knowledge, there is no empirical work related to business analysis in DT. In this paper, we start filling this gap by analysing the skills and practices of business analysts in DT in the form of a multivocal literature review. We adopted the context, content, process, and outcomes framework to review both peer-reviewed and a selection of grey literature to investigate the services, activities, skills, and work practices offered by business analysts within the context of DT.

2   Related Work

This section will review related work in the areas of Business Analysis, DT and Service Science literature.

2.1   Business Analysis

Business analysis, as defined by IIBA (2015)) in Business Analysis Body of Knowledge (BABOK):

> "Business Analysis is the practice of enabling change in an enterprise by defining needs and recommending solutions that deliver value to stakeholders." (IIBA 2015)

Business analyst (BA) flourished in the 1990s as an IS discipline to understand business problems, defining requirements, and the evaluation of solutions (Paul & Tan, 2015). BA is an employee in the organisation who may be associated with the business or IT functions and performs business analysis tasks described in the BABOK guide, regardless of their job title or role (Babar et al., 2014). BA role IIBA (2015) describes the BA as any person

Paul and Tan (2015) noted that the role of BAs is to bridge the gap between IT and business, and they focus the business requirements for the development of IS rather than just the software requirements. The prime function of BAs is to ensure that the technology is being used to achieve the business goals, and they coordinate to improve the business efficiency and productivity with new IT solutions (Richards & Marrone, 2014).

The academic literature discusses the role of BA to be the broker between users and IT professional, gathers and analyse business requirements, analyse the current state and design the improved business processes (Vongsavanh & Campbell, 2008). At the high-level BA investigates the business systems (organisation structure, staff, IT systems, and processes), evaluates actions to improve the business operations, document the business requirement for the IT support staff, and elaborate requirements in the evolution of system development (Paul, Cadle, & Yeates, 2014).

2.2   Digital Transformation

DT is the reinvention of the organisation, starting with its vision and strategy, business processes, organisation structure and culture (Gurbaxani & Dunkle, 2019). A more elaborated definition by Vial (2019) is noted below.

> "a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies." (Vial, 2019)

The path to the DT starts with the enablement of digital technologies and eventually reach to the digital business transformation (LeHong & Walle, 2018). However, as noted by Kane (2019), business challenges cannot be just resolved by technology, and the people in the organisation play an essential role in developing a productive solution. The cultural factors (agility, willingness to experiment, and cross-functional teams) plays a vital role for DT (Euchner, 2019), which are beyond the technology horizon. Implementing digital technology is a relatively easy task, but it is difficult to change the way of doing business and the employee's work practices (Kane, 2019).

The success of implementing technology for the organisation requires close collaboration of IT and business (Manfreda and Indihar Štemberger 2019), which becomes even crucial for DT projects. There is always a risk of losing the focus on the bigger picture of enterprise strategy when implementing individual technology projects under the DT programs. DT being a long term strategic program is distinguished from the typical short term improvement projects as any change in circumstances leads to the revision of the goals. Therefore, there is a need to have focused professionals who can deliver business value as a trusted advisor and can adapt to the new reality quickly. They need to have a greater knowledge of customers' expectations and competitors challenges as well as increased knowledge about innovative technologies.

2.3   Service Science

Service Science is primarily concerned with people and their role in value creation within and across the boundaries of service systems (Maglio et al. 2015). Service systems are value-creation networks and comprised of organisation, technology and people, which could be an as small entity as a single knowledge worker or big enough to constitute a global service system composed of different enterprises (Maglio et al. 2006).

Service science has a multidisciplinary approach which can be used to understand the role of ICT in service innovation which is the core concept of DT. According to Matzner et al. (2018), DT is a type of 'service transformation'. It is a multi-layered program, and business transformation is one significant aspect of it. Creating new value proposition, reduction in operational cost and value innovation are all related to the business transformation, and can be elaborated well with the concept of service science (Bithas, Kutsikos, Sakas, & Konstantopoulos, 2015).

Service innovation is the key for the enterprises to remain relevant in the industry by introducing new value propositions in the era of digital disruption. The goal of DT for an enterprise is to achieve the capability of innovation by improving its people, processes, business models and generating the continuous and significant value proposition for its customers. In all the forms of service innovation, technology plays a vital role in value-creation and to develop a service system. In additon, Peltier et al. (2020)) mentioned that service innovation requires to integrate the interactions among the multiple actors in the service ecosystem. In this context, BA can be defined as a knowledge worker (actor) in the value creation network in the context of service science.

The definition of service as noted by Stoshikj, Kryvinska, and Strauss (2016), "the application of competences (knowledge and skills) by one entity for the benefit of another", is the fundamental aspect of the BA in a service ecosystem. BA is the actor in the service system which generates the value-cocreation with its knowledge and skills in service innovation activities and hence DT. As the value-creation takes place in networks (Stephen L Vargo & Lusch, 2016), there is a need for the mechanism of resource integration and service exchange through the coordination. Therefore, one of the core skills of BA in engaging stakeholders' exhibits the existence of such a mechanism in the process of value-cocreation. The BA is the actor in the service system who facilitate and integrate the actor-to-actor engagements with their knowledge and skills. However, the lack of empirical research from the service-oriented requirements perspective is highlighted in the literature (Ridha and Senapathi 2020).

2.4   Theoretical Framework

As mentioned by Ward and Elvin (1999), IT is an enabler of the change in achieving business outcomes in the form of initiation, facilitation or supporting the change. Therefore, this framework provides the blueprint to identify the role of BA, considering the fact that the primary task of BAs is to enable the change. Moreover, the DT projects induce the change within the organisation that is managed with change management methodologies in the real-world DT programmes. Therefore, this framework makes it suitable to utilise in the context of this research project. Table 1 gives a summary of the adapted Four-Dimension framework.

Context	The context is the business analysis work for the DT in an organisation
Content	Characteristic of the business analysis project to meet the objective of DT goals
Process	Tasks, activities, procedures, and skills required to perform the business analysis
Outcome	The contribution of the business analysis activities for the success of the DT

Table 1. Four-Dimension Framework

The context is the business analysis work for the DT. This dimension defines the overall environment of the research project as the business analysis work for the DT projects in an organisation. The content dimension can be described as the characteristic of the business analysis to meet the objectives of DT goals. In the context of this research study, content dimension has been tailored to the specific DT projects in the domain of IS functions. The process is related to the tasks, activities, procedures, and skills required to perform the business analysis. In the process dimension, the focus is on the tools and techniques used by BA typically to implement the DT programs. The outcome dimension provides the result of the previous dimensions. However, it is different from the usual outcome of IS projects that can be characterised as either the success or failure. It is the result of the business analysis activities for the progression of the DT projects in the form of value propositions offered by BA.

3   Research Methodology

The theoretical framework for 'IT and Change Management' which was first presented by Pettigrew and Whipp (1991) and later modified by Ward and Elvin (1999) provides the basis for the research design. This framework was further adapted by Paul and Tan (2015) to investigate the role of BA in IS development and understanding the nature of business analysis work. The four dimensions of this framework: context, content, process, and outcomes were adapted to conduct a multivocal literature review to answer the following research question:

RQ1: What services, activities, skills, and work practices are offered by business analysts in the context for DT?

The overall methodology adopted by the study is shown in Figure 1. The review of academic literature review provided insights into the general role of BA in IS projects. Moreover, it helped to define a protocol for the research by expanding the Four-Dimensional framework into further focus areas in the context of DT activities. As noted, the academic literature lacks the material related to the role and responsibilities of BA, so MLR method was adopted. The MLR approcah was then segregated into two parts, first by reviewing whitepapers, blogs, articles to understand the significance of BAs for DT programs. The other segment is related to the job advertisements to recognise the skills, tasks, and techniques used by BA for DT activities. The Job Description (JD) outlined in those advertisement provides an insight into the real-world tasks and activities performed by BAs for DT programs. This information gives the ability to evaluate theoretical analysis against the actual practices performed by BAs.
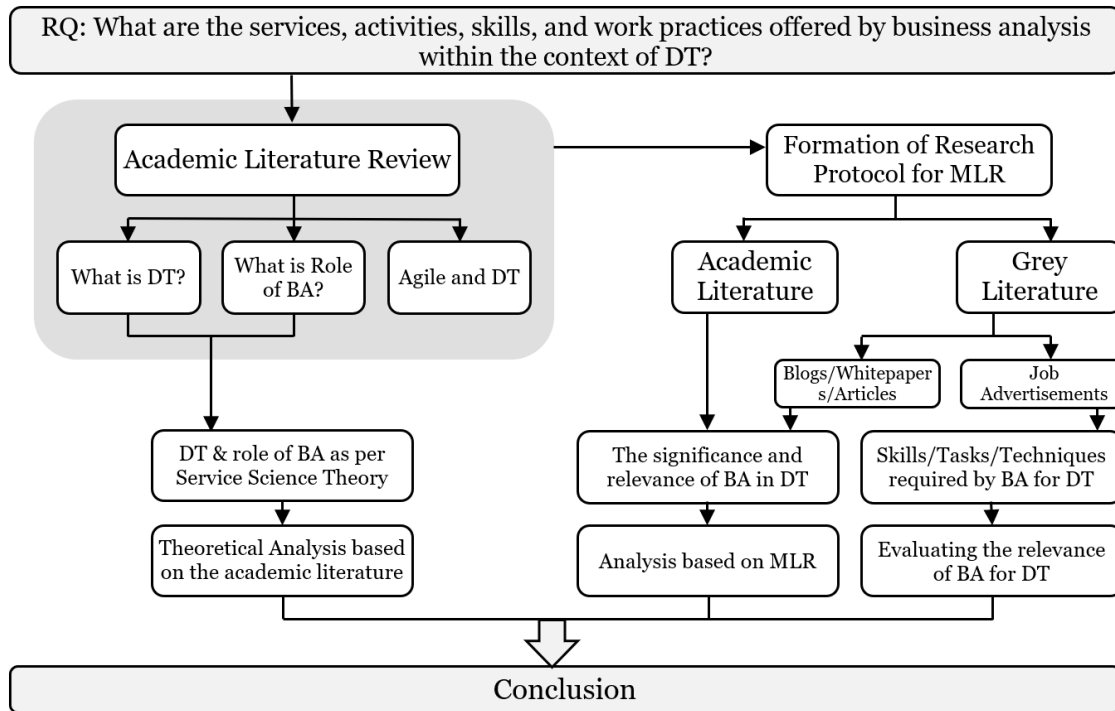
Figure 1: Research Methodology

3.1 Multivocal literature review

As previously identified, the lack of relevant academic literature related to the role of the BA in DT prompted the inclusion of grey literature to understand the significance and value offered by BAs in DT activities.

MLR is the method like Systematic Literature Review (SLR), and it covers the Grey Literature (GL) which comprises the non-academic literature including blog posts, videos and whitepapers, books, magazines, government reports and other searchable material (Garousi et al. 2019). It represents any recorded, referable and sustainable information resource made publicly available without a traditional peer-review process (Savić 2020). It is used when there is a gap between the academic research and the practitioners' knowledge about any contemporary phenomenon (Garousi et al. 2016).

This section explains the process of conducting the MLR for the research project and explains the scope and limitatioin for such methodology.

Research Protocol: Four-Dimension framework, which was selected for the research project has been expanded to further subcategories as the focus areas as mentioned in Table 2 . This structure provides the protocol for the search keywords and defines the theoretical boundaries to confine the research. These focus areas have been extracted from the academic literature based on the concepts of DT and business analysis work. The list of strings has been presented in Table 2 to search the material in search engines.

Search mechanism: The main sources for the grey literature included the International Institute of Business Analysts (IIBA), and BATimes from where case studies, whitepapers, and experience reports related to business analysis work. Search engine Google was exploited with advance search capabilities to search these keywords and related terms in the context of business analysis.

Framework	Focus Areas	Search Strings
Context	Customer Experience, Business Process, Business Models, Digital Disruption	"customer experience" AND "business analyst" "business process" AND "digital transformation" "Digital Disruption" AND "Business Analyst"
Content	Change Management and Facilitation Innovation Agile Methodologies	"business change" AND "digital transformation" AND "analyst" "innovation" AND "business analyst" "Change Management" AND "Business Analyst"

		"Product Management" AND "Business Analyst"
		"Agile" AND "business analyst"
Process	Define the business change project, Define and improve business processes, Evaluate feasibility and develop a business case, Define requirements, Support change deployment, Engage with stakeholders	"stakeholder" AND "business analyst"
		"Business Analyst" "Digital Transformation" "Job Description"
Outcome	Collaboration	"Business Analyst" "Digital Transformation"
	Deliver Value	"value" "Business Analyst" "Digital Transformation"

Table 2. Search protocol based on Four-Dimension Framework and search strings

Similarly, to search the academic literature as per the defined protocol for MLR, we used the following search engines: Google Scholar, Emerald Insight, Taylor & Francis ,and ACM Digital Library; Emerald insight and Taylor & Francis were used as they include studies in the domain of business and information sciences. The same practice was used to limit the articles by adjusting the range from 2015 and onwards to avoid any outdated content which may not be relevant in the current state.

The inclusion criteria have been set to mainly GL forms like blogs and whitepapers; however, the job advertisements for the BAs roles have been explicitly included. Job advertisements for the role of BAs provide the real demand and requirement in the industry as many have been listed with a detailed job description. Job advertisements helped to understand the requirement of BA in the DT programs and provide the desired skills, tasks and tools for their role. General web search engines provide some material in the form of general advertisement, and usually, they included in the search results. Those advertisement webpages (websites) were excluded as the content published there may have posted under the influence of financial interests, and it may jeopardise the research by adding such biased content. Especially the content from the training providers was excluded as the aim of their material is to attract the individuals to earn more enrolments for their programs which might have some skewed opinions.

The vital aspect of the GL review is the quality assessment of the material. Garousi et al. (2019) have noted the quality assessment checklist, which provided the necessary guidelines to acquire the quality material from GL related to this research project. Only the content was selected, which has mentioned the name of the author of such material. Usually, with the author name, there is some synopsis available for the career progression of the writer, which is helpful to assess his/her knowledge and skills for the topic. Therefore, it helped to shortlist the articles from individuals with broad industry experience. The NCapture for NVivo (qualitative data analysis software package) was used to download the material and total of one hundred and fifty-three files were saved by following the inclusion criteria. Later sixty-five files were shortlisted based on the inclusion and exclusion criteria[1].

4   Findings and Analysis

In this section, the focus is to analyse the role of BA as perceived in the practitioners' domain with the help of MLR in the context of DT programs only. The findings are discussed using the four-dimension theoretical framework described in section 2.4. Each dimension is analysed using the focus areas derived from the review.

4.1   Context

Customer experience: As noted by (Nahrkhalaji et al. 2018), the three key focus areas for DT are business models, operational processes and CX. The CX designers translate the desirability by understanding the customer's requirement and come with a solution profitable by the organisation while the BA must use digital technology to ensure the feasibility and viability as per the business requirements. The two collaborate well for the overall business improvement but consuming different channels for the same task.

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[1] These references are not included due to page limitation. However, the list will be provided on request.

Buisness process and modelling: One of the vital DT domains, as identified by the academic literature, is improving and defining new business processes. While analysing business processes and models is well known as a competency related to business analysis, in the context of DT, the focus in on business models that are reliant on technology to deliver new forms of value to developers and customers. BAs must utilise Business Process Modelling (BPM) techniques based on relevant technologies to understand the flow of the work among multiple teams and identifying the failures or the bottlenecks in the business processses.

Digital disruption: From a technology perspective, digital disruption is about the implementation of enhanced or entirely new technology. In DT, it can be characterised as the high-level business model readiness for digital operation and high level of masteries for digital technologies relevant to the sectors (Tekic and Koroteev 2019). Uber is the prime example of digital disruption in the traditional taxi service when it revolutionised the commuting services by adopting digital technologies along with the novel business model approach.

From the MLR, it was found that digital disruption is seen by the BA community as the transformed business models, with cutting edge technology and ultra-focusing the needs of customers (Egeland 2019). There is need for BAs to enhance their knowledge for innovative technologies and understanding of the customers and competitors to become the trusted advisers in the modern business world (Brennan and Phul 2017). The understanding of the novel technologies termed as the significant proficiency needs to be acquired by the BAs.

4.2 Content

Change management and facilitation: According to McKinsey (2018) report, change management plays a vital role in achieving a successful outcome for DT. One of the most significant functions of BAs is to enable valuable change within the organisation (IIBA). The main reason for the rate of failure in DT projects is due to the greater emphasis on technology and less on the people, process, culture and mindsets (Boutetière et al. 2018).

The BA acts as the catalyst for the change, regardless of whether it is business-oriented or system-oriented. BA is involved not only in the gathering the requirements of the business and user acceptance validation, but in the context of DT must act as transparent change leaders as they serve as the main source of truth for projects. With successful stakeholder management, BA can minimise the resistance to change and eventually, a successful transformation. Understanding the culture of the organisation is one of the traits of BA that can be leveraged to develop a change management plan.

Innovation: DT is attaining the capability to innovate for IT-enabled services to support the business for better customer experience and to remain relevant in the competition. Innovation within an organisation is not a responsibility of any individual or a business function but the collaboration among multiple functions and to form a collective creative team to offer an improvised value proposition. BAs assumes the core role of facilitator within an organisation in the process of innovation from conceiving, testing, refining and implementation. The traditional toolset of BA incorporates many idea generation techniques: brainstorming, idea mapping and others which can be used with create and visual ideas and technolgoies appropriate for innovation in the digital domain (Hass 2015).

Agile methodologies: Track (2019) noted that Agile principles and methodologies had become part and parcel of DT. It is usually considered PO (as being the conduit between business and IT) can provide a business point of view; moreover, the agile team members are capable enough to understand the requirements of end-users. It is true for simple IS projects, but when it comes to the DT, it no more remains relevant. The spectrum of DT requires the holistic view of business, including all the stakeholders and the realisation of people, processes and culture within the organisation, which is not possible without the specialist like BA. This is well expressed in the following quotation.

> "If there is a project with many repeatable steps and a few unknowns, a BA is not necessary. But when the team relies on stakeholder input, the product is new, or a significant change or your Product Owner struggles to break down features to stories, the team needs a business analyst or team of BAs to succeed." (Vineyard 2015)

Effective communication is one of the core skills of BA, which demonstrates its importance to translate user requirements in a way which the developers can understand. In DT, BAs must leverage these skills with appropriate tools and technologies to supplement user stories, visual user journeys, wireframes and mock-ups (Jones 2019). The findings also highlight that BAs can provide necessary assistance to POs in agile teams by liaising between PO and development teams and providing an overall business perspective.

4.3   Process

Define the business change project: Business change is among the core activities done under the flagship of DT programs to improve or restructure the overall business operations, processes and people. As digital transformation is about business change; implementing new business processes and deploying the supporting technology" (Clarke 2019)

Change requires a deep understanding of current problems and issues before the planning phase. Secondly, it is crucial to understand the significance of the need for change. BAs are particularly well suited for the task as they are equipped with the required knowledge and skills. The business improvement project which can be referred to as the business transformation in DT is business change in a nutshell for which BA holds the significant authority and involvement in the areas of investigation, problem definition, environment analysis, and user role modelling.

Evaluate the feasibility and develop a business case: while the previous point deals with identifying the business change project, evaluation relates to using appropriate tools and techniques to filtering the options developed to resolve them after analysing the impact and the risk associated with them. This also includes eveluating the technical, financial and business feasibility of the shortlisted options which are well aligned with the business strategy.

Define and improve business processes: DT programs stress the importance of business process improvement, optimisation and transformation. It starts with the mapping of the current process to define the as-is state and identifying the areas of improvement. Business process automation is a crucial attribute of DT to reduce the cost and to minimise the delivery time. Another aspect of DT is disrupting and building new business processes to achieve improved efficiency with the help of technology. This involves a higher delivery and operational risk due to poorly designed business processes and calls for the comprehensive business process management tools and techniques (Reed 2020).

While the significance of business process modelling is well-recognised as a technique to map the tasks and activities for identifying issues and bottlenecks in the workflows, in the context of DT a BA must be able to confidently and efficiently elicit, perceive, model and communicate how a business process will be implemented by DT projects (Metera 2019).

Support change deployments: The usual tasks of BA to support the change deployments deals with helping the organisation in three crucial areas of the organisation: business, IT, and people. While BAs continue to support in these areas, they must possess good understanding of the technical complexity and the technology to enable successful change deployments.

Engage with stakeholders: Engaging with stakeholder is one of the most common and well-known tasks of a BA. Communicating with stakeholders is a routine job of a BA, where they not only interact with individual stakeholders but facilitate the collaborative workshops and resolve the conflicts as part of their stakeholder management processes. Stakeholder management not only plays a vital role in small IS project, but it expresses the utmost importance in more significant initiatives such as DT, where it refers to a collection of many projects under one umbrella. DT programs can span the whole organisation across many functions, so effective stakeholder management continues to be one of the core skills of a e BA in the context of DT activities.

4.4   Outcome:

DT is not a discrete phenomenon and comprises of many short term and long-term projects. The success of the IS projects is usually measured within the triple constraints of time, cost, and quality (Paul and Tan 2015). However, while the success of DT can be measured against the KPIs and not limited to productivity indicators but also to digital maturity, organisational agility, improvement in the customer experience, and business continuity. The outcomes of DT can influence the preformance of an organisation and be be measured by factors such as profitability, customer retentions, return on investment, cost of doing business, and achieving a high quality of innovation (Osmundsen et al. 2018). Another factor which differentiates DT from other transformation projects is the process of continuous improvement which does have a start, but no end as the requirement to keep improving is ongoing in order to be able to cope and compete with the dynamic changes in the market. Therefore, the outcome of the activities of BA can be assessed based only on the value-added during the journey of DT, and their contribution in achieving the strategic organisation goals under the DT vision.

The profound role of BA to collaborate between different stakeholder groups is particularly important in DT situations where the teams' lack the understanding of business needs and processes. The scope of DT programs is so broad and diversified as there is always a need to steer the projects aligned with the

bigger picture of business strategy. BAs, with their core skills and in-depth knowledge of concerned business areas, can contribute well for the same as well as providing necessary guidance in the advent of changing business circumstances.

4.5 Job Description

Advance search option was used to filter job advertisements related to "Business Analyst" and "Digital Transformation". This resulted in twenty-five job descriptions. NVivo was used to categorise the themes observed as Skills, Tasks, and Techniques as listed in Table 3.

Categories	Themes
Skills	Communication Skills, Agile Methods, Problem Analysis, Technology Savvy, Interpersonal Skills, Product Management, SDLC, Gap Analysis, Structured Methodologies, Leadership, Business Process Models, Requirement Elicitation, Collaboration Skills, Business Savvy, Business Transformation, Data Management, Analytical Skills, Customer Focus
Tasks	Managing Requirements, Managing Stakeholders, Team Facilitation, Documentation, Business Process Analysis, Collaboration, Business Case, IT Advisor for Business, Scope Management, Solution Design, Facilitating Teams, Business Alignment, Change Management, Training Material, Analyse Business Operations, Process Automation, Supporting Agile Teams, User Manuals, Artefacts and Breakdown
Techniques	Workshops, Epic/User Stories, Use Case, Test Scenarios, Wireframe, Product Backlog Items, Process Flow Diagram, User Journeys, RASCI Matrix, Six Sigma, Mock-ups, Content Matrix, Story Card, Interviews, Sprint Velocity Report,

Table 3. Themes as identified in JD

The data analysis revealed that 'communication skill' is the top desired skill for the role of BA-(DT) with the highest number of occurrences. Second-most required skill is understanding and experience of Agile methodologies and culture. This implies that the BA role is still relevant as agile methods continue to dominate the DT space. Product management is another prominent desired skill which hints that the BA is required to assume the role of PO or at least support the PO tasks and activities.

The job descriptions also highlight the skills related to latests technology trends and customer experience platforms. This is consistent with the findings from the MLR which highlights that as DT is enabled by technology, BAs must know the latest technology trends so that they can participate in the process of designing solutions and evaluating the feasibility based on financial as well as technical aspects. BAs must work closely with other IT management personnel to identify, evaluate, select, and implement latest technologies to support the business plans and IT strategies (Wisdomjobs 2019)

Collaboration and facilitation were among the prominent skills mentioned in the job descriptions for BAs in DT. Facilitation has a broad spectrum, and it is not just limited to facilitating communication between technical and non-technical stakeholders (Business and IT). On the other hand, the collaboration is involved in supporting the product and project teams and provide useful knowledge in analysis and development activities and the leadership role to keep the teams aligned with the business objectives.

5 Conclusion

In the avenue of this research project, it has been discussed that DT occurs through the implementation of new or improved service systems, and service innovation is the key to the development of such improved service systems. The services offered by BA is vital in such interactions for the service innovation and supporting the DT programs.

Further, it has been analysed that the rise of Agile methodologies may not jeopardise the role of BA. Instead, they can assist PO with their extensive analysis techniques. Moreover, they can help the teams with their collaboration, facilitation and the stakeholder management skills. There is some evidence in the grey litearture that they can not only assist PO in managing backlog and prioritising the requirements, but they can assume the role of PO to guide the teams in understanding business

requirements. Hence this is the reason that the roles of BA involving DT, the knowledge and understanding of Agile methodologies is one to top skills desired by employers.

DT is about the development of new business models leveraging innovative technologies. There is evidence found in the GL stressing the need of BAs to be tech-savvy for DT. Therefore, BAs must keep abreast of emerging technologies to remain relevant for the DT tasks. With the help of MLR, the information from different sources has been synthesised, and analysis has been presented. This study has provided the source for a further empirical study to investigate the role of BA in practical DT programs.

6   Limitations and Future work

The tasks and activities performed by BA are extracted from the multivocal literature review which was quite helpful in understanding the value being offered in DT programs. However, it lacks the point of view of other actors in the service system that how they realise the value offered by BAs in the DT activities. Mainly the findings are based on case studies and reports produced by DT, business analysis professionals or the bodies representing the business analysis work. Therefore, it essential to incorporate the point of view of other professionals as well to establish scrupulous research.

DT is a contemporary phenomenon, and there is no historical data available to reach any sort of conclusion. In this study, the relevance of business analysis in the context of DT has been realised based on a multivocal literature review. However, it lacks the in-depth investigation based on real-world experiences. Future research work is required to find source evidence and collecting direct information from organisations that have implemented or in the process of implementing DT programs. Therefore, exploratory case studies will help to justify the analysis presented in this research project.

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